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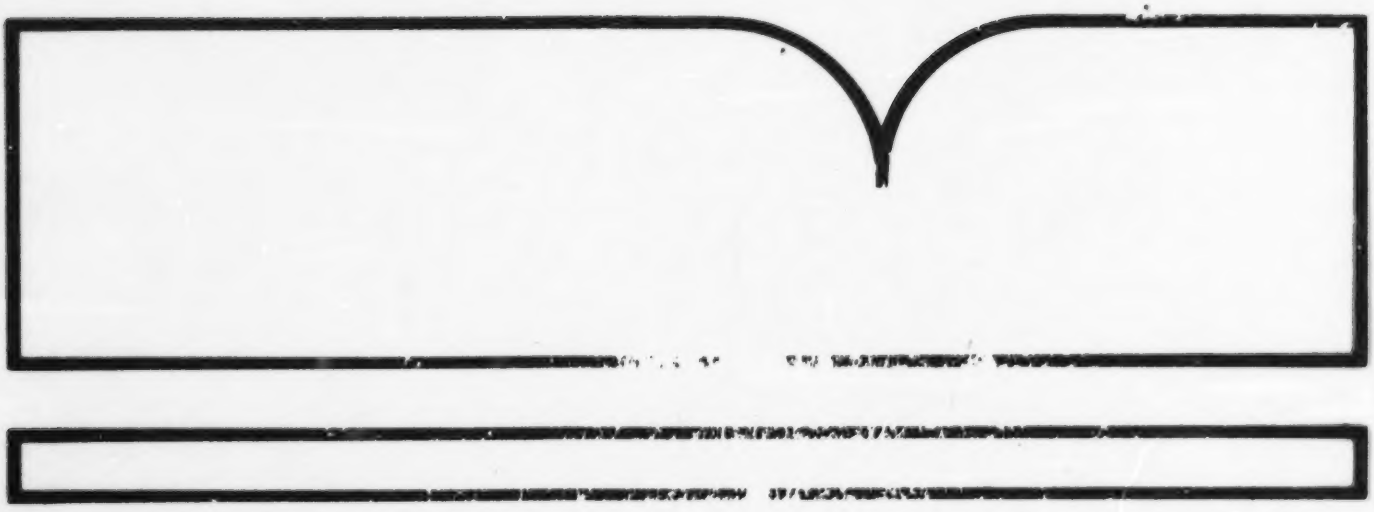
Draft Environmental Impact Statement North Carolina Barrier Island Wastewater Management. Technical Reference Document Financial Planning Handbook for Wastewater Management

(U.S.) Environmental Protection Agency
Atlanta, GA

Jun 83



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Provision of wastewater treatment is a major financial undertaking for a community and its residents. There are multiple objectives to be met: protection of the environment, maintenance of water quality standards, reliable treatment and sufficient capacity to meet present and future demands, to name a few. Naturally, the goal is to fulfill these objectives without placing a financial burden on the community and its wastewater customers or taxpayers. This can best be accomplished by anticipating and understanding the likely financial and management impacts as plans evolve, so that informed decisions can be made to optimize the wastewater treatment plan.

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June 1983

Environmental Impact Statement

Draft

North Carolina Barrier Islands Wastewater Management

Technical Reference Document Financial Planning Handbook For Watewater Management

REPRODUCED BY
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TABLE OF CONTENTS

INTRODUCTION		1
WORKSHEET #1:	FINANCIAL PLANNING CHECKLIST	3
WORKSHEET #2:	COSTS OF PROPOSED IMPROVEMENTS	5
WORKSHEET #3:	COST ESTIMATES BY HOUSEHOLD	7
WORKSHEET #4:	AGENCY ROLES AND COST RESPONSIBILITIES	9
WORKSHEET #5:	AGENCY FINANCIAL CAPABILITIES	11
WORKSHEET #6:	SUMMARY OF FINANCIAL AND INSTITUTIONAL INFORMATION	13

U. S. Environmental Protection Agency
Region IV - Atlanta

NORTH CAROLINA BARRIER ISLANDS ENVIRONMENTAL IMPACT STATEMENT

FINANCIAL PLANNING HANDBOOK FOR WASTEWATER MANAGEMENT

September, 1982

INTRODUCTION

Provision of wastewater treatment is a major financial undertaking for a community and its residents. There are multiple objectives to be met: protection of the environment, maintenance of water quality standards, reliable treatment and sufficient capacity to meet present and future demands, to name a few. Naturally, the goal is to fulfill these objectives without placing a financial burden on the community and its wastewater customers or taxpayers. This can best be accomplished by anticipating and understanding the likely financial and management impacts as plans evolve, so that informed decisions can be made to optimize the wastewater treatment plan.

Whether regional and/or centralized treatment facilities, community facilities, on-site systems, or alternative technologies are being considered, meeting the community's wastewater treatment needs and maintaining water quality will incur some costs. It is important to evaluate at an early stage the costs associated with alternative plans, and other financial and management implications that may arise. If such information is considered as planning progresses and alternatives are narrowed down, the community is more likely to arrive at a solution which is financially and institutionally acceptable as well as technically and environmentally sound.

The worksheets contained in this handbook are aids to financial planning for wastewater treatment. They are designed to address certain issues, provide analytical techniques, disclose information, and function as aids to decision-making regarding financial and management commitments.

A series of six worksheets is included:

- #1: **Financial Planning Checklist**
- #2: **Costs of Proposed Improvements**
- #3: **Cost Estimates by Household**
- #4: **Agency Roles and Cost Responsibilities**
- #5: **Agency Financial Capabilities**
- #6: **Summary of Financial and Institutional Information**

The remainder of this handbook contains brief descriptions of each worksheet and its purpose and gives recommendations for its use. The worksheets themselves are self-explanatory, with instructions incorporated on them.

The six sheets are intended to be used consecutively since the information required for each follows the natural progression of the types of financial and institutional planning tasks which should be a part of the facility planning process. In addition, the worksheets are linked so that in some instances results or responses obtained on a previous sheet are required.

A set of six worksheets should be filled out for each wastewater management system alternative during the alternatives evaluation phase of the planning process. The worksheets are meant to be an integral part of the study, not a task undertaken once the preferred alternative has been selected.

WORKSHEET #1: FINANCIAL PLANNING CHECKLIST

Frequently, the early stages of facility planning are dominated by feasibility studies and consideration of technical alternatives. The financial and institutional implications of what is being considered are often overlooked or given minimal attention beyond estimating gross project costs.

Serious attention should be given to thorough financial planning early in the facility planning process for two major reasons: first, a complete picture of the financial and institutional aspects of various technical alternatives helps to assure selection of a plan which not only meets wastewater treatment needs, but is also implementable from a political and financial standpoint. Second, if potential issues are addressed at an early stage, there will be a better chance for satisfactory resolution and greater acceptance of the ultimate financial plan, particularly in a regional situation where a number of agencies may be involved in system financing and management.

The **Financial Planning Checklist** (Worksheet #1) is an aid to identifying the tasks which should be incorporated into the financial planning process in order to accomplish these objectives. The questions on the worksheet are intended to help those involved in system planning to structure an approach to addressing issues concerned with management and financing. It is recommended that a work plan be developed in which systematic financial and management planning tasks are identified.

Worksheets #2, 3, 4, and 5 are referred to on Worksheet #1 to indicate that many of the questions raised can be answered by using these worksheets to perform certain analyses or address specific issues. Worksheet #6 summarizes the results. A description of the purpose and use of each of the subsequent worksheets follows.

FINANCIAL PLANNING CHECKLIST

A. Issue Identification and Work Plan Development For Financial and Institutional Analysis

	Yes	No
1. Has a **financial management oversight committee** been established with representation of all locally involved agencies, including elected officials, town or county managers, finance officers, and/or utility managers?	☐	☐
2. Have local issues which might affect implementation of financing arrangements, joint management agreements, cost allocation agreements, etc. been identified and discussed among appropriate local agencies and have acceptable solutions been proposed?	☐	☐
3. Has supporting information (such as population estimates, growth rates, and service areas) been reviewed and accepted by the appropriate agencies for use in estimating costs and analyzing financial requirements?	☐	☐
4. Have issues of a financial and institutional nature that might result from the inclusion of special populations in the plan (such as seasonal, major industrial or commercial users) been identified and discussed?	☐	☐
5. Has a **work plan** been developed in which financial and institutional planning and analysis tasks are identified?	☐	☐
6. Has technical facility planning been coordinated with financial and institutional tasks included in the work plan referred to in Question #5?	☐	☐
7. Will all segments of the public and the elected officials be advised of the **costs** of various alternatives and the institutional implications of each prior to selection of a system alternative?	☐	☐

B. Financial and Institutional Analysis

8. Are **cost estimates** for the proposed alternative systems up-to-date, reflecting current cost information and current (1982) price levels?	☐	☐
9. Have **total capital** costs been identified for **all** the components to be included in the proposed system alternatives, including those not expected to be grant-eligible? (See Worksheet #2)	☐	☐
10. Have **total annual** costs been estimated separately for administration, operations, maintenance, and capital replacements for the various alternatives? (See Worksheet #2)	☐	☐
11. Has a judgment been made regarding which of the system cost elements are eligible for outside funding? (See Worksheet #2)	☐	☐
12. Have estimates for differe community, or on-site syst the proposed alternatives, resulting local capital requ		
13. Have estimates been mad households that will be se cluding permanent reside (See Worksheet #3)		
14. Is information presented s calculate their costs? (Se		
15. Have the effects of factor availability of grant fundi considered as far as their per household? (See back		
16. Has a determination been necessary legal and politi and regulate the system?		
17. Will existing agencies as new entity be created to m Worksheet #4)		
18. Have all agencies which w system been identified? (S		
19. If more than one agency is tions and maintenance co been proposed, discussed		
20. Will an **intergovernmental** and responsibilities for all agreed upon? (See Worksh		
21. Have the **financial** consequ improvements such as loc growth rates, and types of Worksheet #4)		
22. Have **ordinances** been est of the proposed system in quirements for hook-ins, c (See Worksheet #4)		
23. Has the current **financial** financially involved in the tial to assume new financ		
24. Have various methods of in regard to statutory limi projects, or the financial s		
25. Has a system of **fees and** nual operations, maintena Worksheet #5)		

***Refer to instructions at the right before completing the worksheet.**

G CHECKLIST*

WORKS

Agency _____

Date _____

	Yes	No
12. Have estimates for different facility alternatives (such as regional, community, or on-site systems) been made regarding total cost of the proposed alternatives, expected outside funding support, and resulting local capital requirements? (See Worksheet #2)	☐	☐
13. Have estimates been made of **average annual costs** for typical households that will be served by the proposed alternatives, including permanent residents as distinct from seasonal residents? (See Worksheet #3)	☐	☐
14. Is information presented so that non-residential users can readily calculate their costs? (See Worksheet #3)	☐	☐
15. Have the effects of factors such as inflation, growth in households, availability of grant funding, or use of plant investment fees been considered as far as their effect on local system costs and costs per household? (See back of Worksheet #3)	☐	☐
16. Has a determination been made of which agencies have the necessary legal and political powers to finance, operate, manage, and regulate the system? (See Worksheet #4)	☐	☐
17. Will existing agencies assume all system responsibilities, or will a new entity be created to manage and operate the system? (See Worksheet #4)	☐	☐
18. Have all agencies which will bear **financial responsibility** in the system been identified? (See Worksheet #4)	☐	☐
19. If more than one agency is to bear capital financing and/or operations and maintenance costs, has a formula for **cost allocation** been proposed, discussed and agreed upon? (See Worksheet #4)	☐	☐
20. Will an **intergovernmental agreement** be established by which roles and responsibilities for all involved agencies are assigned and agreed upon? (See Worksheet #4)	☐	☐
21. Have the **financial consequences** of secondary effects of proposed improvements such as locations and density of new development, growth rates, and types of development been identified? (See Worksheet #4)	☐	☐
22. Have **ordinances** been established to regulate and ensure support of the proposed system in terms of effluent discharges, requirements for hook-ins, design standards, and extension policies? (See Worksheet #4)	☐	☐
23. Has the current **financial condition** of all agencies which will be financially involved in the system been assessed in terms of potential to assume new financial commitments? (See Worksheet #5)	☐	☐
24. Have various methods of financing the local costs been considered in regard to statutory limitations, effect on other agency financing projects, or the financial status of the agency? (See Worksheet #5)	☐	☐
25. Has a system of **fees and charges** been devised for support of annual operations, maintenance, and administrative costs? (See Worksheet #5)	☐	☐

Inst

1. Worksheet #1 as a joint effo managers, fin elected offici involved in the planning proc **identify tasks** institutional a be completed facility planni a facility plan alternative.

2. The response this worksheet needs for spec form the basis **plan** to resolve financial and necessary to implementatio

3. Section A con relate general planning proc managed; in p and institutio approached. S questions reg analytical nee and institutio establish an effective syste successful im that in Section followed by a worksheet in completed, w answers to th

Prepared for EPA Region IV
for N.C. Barrier Islands EIS by BMML Briscoe, Maphis, 2855 Valmont Roa

ST*

WORKSHEET #1

Agency _____

Date _____

	Yes	No
r different facility alternatives (such as regional, ite systems) been made regarding total cost of natives, expected outside funding support, and ital requirements? (See Worksheet #2)	☐	☐
en made of **average annual costs** for typical ill be served by the proposed alternatives, in- t residents as distinct from seasonal residents?)	☐	☐
ented so that non-residential users can readily ts? (See Worksheet #3)	☐	☐
f factors such as inflation, growth in households, t funding, or use of plant investment fees been s their effect on local system costs and costs e back of Worksheet #3)	☐	☐
on been made of which agencies have the d political powers to finance, operate, manage, ystem? (See Worksheet #4)	☐	☐
cies assume all system responsibilities, or will a ted to manage and operate the system? (See	☐	☐
which will bear **financial responsibility** in the lfied? (See Worksheet #4)	☐	☐
gency is to bear capital financing and/or opera- nance costs, has a formula for **cost allocation** cussed and agreed upon? (See Worksheet #4)	☐	☐
mental agreement be established by which roles for all involved agencies are assigned and Worksheet #4)	☐	☐
consequences of secondary effects of proposed h as locations and density of new development, types of development been identified? (See	☐	☐
een established to regulate and ensure support tem in terms of effluent discharges, re- k-ins, design standards, and extension policies?)	☐	☐
ancial condition of all agencies which will be d in the system been assessed in terms of poten- financial commitments? (See Worksheet #5)	☐	☐
ods of financing the local costs been considered ory limitations, effect on other agency financing ancial status of the agency? (See Worksheet #5)	☐	☐
es and charges been devised for support of an- aintenance, and administrative costs? (See	☐	☐

Instructions

1. Worksheet #1 should be completed as a joint effort by town or county managers, finance officers, and/or elected officials of the agencies involved in the wastewater facility planning process. Its purpose is to **identify tasks** for financial and institutional analysis which should be completed in the early phases of facility planning, prior to adoption of a facility plan or final system alternative.

2. The responses to the questions on this worksheet will help identify needs for specific tasks, which may form the basis for developing a **work plan** to resolve issues and answer financial and institutional questions necessary to assure successful plan implementation.

3. Section A contains questions which relate generally to the facility planning process and how it is being managed; in particular, how financial and institutional tasks will be approached. Section B contains questions regarding specific analytical needs to resolve financial and institutional issues and establish an acceptable structure for effective system management and successful implementation. Note that in Section B each question is followed by a reference to another worksheet in this series which, when completed, will provide specific answers to the questions.

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Briscoe, Maphis, Murray & Lamont, Inc.
2855 Valmont Road, Boulder, Colorado 80301 (12/81)

WORKSHEET #2: COSTS OF PROPOSED IMPROVEMENTS

Different facility engineering firms may approach the identification of system costs in various ways within a plan. The costs may be broken down to varying levels of detail; certain categories of costs may not be addressed; some plans contain estimates only for those system elements which are expected to be financed, at least in part, by state or federal funding. Worksheet #2 provides a consistent method of summarizing cost estimates for each of the various system alternatives.

The **Costs of Proposed Improvements** worksheet contains lines for entering costs associated with all the components and/or functions anticipated for a particular system alternative. It is applicable for all types of treatment systems, including central and/or regional, community facilities, and individual on-site systems. A summary of all estimates, including capital and operations and maintenance costs, can be entered on a single sheet; in addition, the expected non-local funding amounts are identified so that a clear picture of local financing responsibilities is obtained.

This worksheet should be used after preliminary estimates for system alternatives have been furnished by the engineering consultant. The engineer and a community finance officer should cooperatively use this sheet to summarize all costs associated with each viable alternative. Although preliminary estimates should be made as accurately as possible, the costs entered on Worksheet #2 should be updated as better information becomes available (including availability of grant funds), to serve as a basis for further analysis of system plans.

COSTS OF PROPOSED IMPROVEMENTS*

Wastewater System Components/Functions	5-year Estimated Capital Costs			
	Total Capital Cost	– EPA Grant Eligible Amount	– Fed./State/ Other Funding	= Local Capital Cost
Centralized Facilities				
1. Treatment Facility(ies)				
2.				
3. Interceptor Sewers				
4.				
5.				
6. Pump Stations & Force Mains				
7. Ocean Outfall				
8. Collection Lines				
9. Sludge Handling & Disposal				
10. Land (Incl. Rights-of-Way)				
11. Management & Administration				
Community Facilities				
12. Facilities & Equipment				
13.				
14.				
15. Land (Incl. Rights-of-Way)				
16. Management & Administration				
On-Site Facilities				
17. Facilities & Equipment				
18.				
19.				
20. Land (Incl. Rights-of-Way)				
21. Management & Administration				
Other Costs				
22. Step 2-3 Planning & Engineering				
Miscellaneous Identifiable Costs				
23.				
24. **Total Cost of Proposed Improvements**	$	– $	– $	= **Total Local Capital Cost** $
25. **Total Local Capital Costs (A.) and Total Annual O&M Costs (B.)**				**A.** $

Names of individuals/firm who prepared cost information: _____

Sources of information and methods used to calculate cost estimates (describe):

*The basis for the cost calculations contained on this worksheet, including key assumptions, is explained in the instructions provided at the r

First Year of **Full** Operation: 19____
Description of Proposed Improvements:

WORKSHEET #2

Agency _____

Date _____

Estimated Annual Operations & Maintenance (O&M) Costs (For 1st Year of Full Operation)

...ocal ...tal Cost	Personnel (Incl. Contracts) +	Materials (Incl. Power) +	Reserve for Replacements +	Other =	Annual O&M Cost

WORKSHEET #3: COST ESTIMATES BY HOUSEHOLD

Since the bulk of the system costs will ultimately be paid by community residents, taxpayers and/or system users, it is important to develop an estimate of annual costs attributable to an average or typical household to be served by the proposed system. It must be emphasized that these household cost estimates are not necessarily the same as the rates that will be charged for wastewater treatment. Rather, the figures derived on this worksheet are an estimate of what it will cost for an average household to receive treatment within the proposed system. Rates will be established at a later date, and constitute a decision to be made by the individual community.

Cost Estimates by Household (Worksheet #3) provides a step-by-step methodology to express total local system costs, including any existing cost components which are to be incorporated into the proposed system, in terms of household costs. This worksheet is designed to provide estimates for two classes of "typical" households: the average permanent residential and the average seasonal (or part-time) residential household. If there is an insignificant demand for part-time service, this part of the worksheet can be disregarded and estimates can be obtained only for permanent households. In addition, an estimate of costs per commercial or other specified user may be obtained by following the steps given in Instruction #6 on the worksheet.

Worksheet #3 provides for computation of annual debt repayment costs derived from the local capital cost total estimated on Worksheet #2 and combines costs associated with the proposed improvements with those which are to be carried over from existing facilities. A series of computational steps are then followed to allocate annual system costs to permanent and seasonal households. The methodoloy provided is a simplified method for calculating cost burden; the approach may be tailored to meet the needs of a specific situation.

In addition to computing an average annual cost per permanent and seasonal household in uninflated (1982) dollars, the back of Worksheet #3 gives instructions for conducting sensitivity (risk) analyses. The purpose for this is to test the effects of variable factors, such as inflation, growth in households, local funding requirements, and use of plant investment fees, on the individual household costs.

COST ESTIMATES BY HOUSEHOLD*

First Year

# of Perm

# of Seas

Step 1: Summary of Total System Costs For Year 1 and Year 5

(See Instructions #1, 2, 3)

A. Calculation of Annual Debt Repayment for Proposed Improvements:

1. Total local capital cost: $ _____ (Worksheet #2, Line 25a; see Instruction #3)
2. Less: available local funds: (_____) (See Instruction #4)
3. Remainder: amount to be financed: _____ (Line 1 – Line 2)
4. Add: legal & underwriting fees: _____ (See Instruction #4 or use 1.5% of Line 3)
5. Add: reserve amount (if required): _____ (See Instruction #4 or use 10% of Line 3)
6. TOTAL CAPITAL DEBT: _____ (Line 3 + Line 4 + Line 5)
7. Estimated annual debt repayment: _____ (See Repayment Schedule on reverse side)
8. Will hook up charges, called Plant Investment Fees (PIF's), be charged new customers to offset part or all of the projected annual debt repayment costs? Yes ☐ No ☐
9. If yes, what is the planned PIF per new connection? $ _____

	Year 1	Year 5
10. Estimated number of new connections in preceding year:	a. _____	b. _____
11. Estimated total PIF revenue (Line 9 × Line 10 a, b):	a. $ _____	b. $ _____
12. **Net** annual debt repayment (Line 7 – Line 11 a, b):	a. $ _____	b. $ _____

B. Annual Total Cost of Existing System plus Proposed Improvements:

	Year 1	Year 5
Existing System: (See Instruction #3)		
13. Annual repayment on existing debt:	a. $ _____	b. $ _____
14. Annual O&M to be carried over:	a. $ _____	b. $ _____
Proposed Improvements:		
15. Net annual debt repayment (Line 12 a, b):	a. $ _____	b. $ _____
16. Annual O&M (Worksheet #2, Line 25 b for Year 1; estimate Year 5):	a. $ _____	b. $ _____
Total System:		
17. Total debt repayment (Line 13 a, b + 15 a, b):	a. $	b. $
18. Total annual O&M (Line 14 a, b + 16 a, b):	a. $	b. $

Step 2: Allocation of Annual Costs to Permanent, Seasonal Households

A. Allocation of Annual Debt Repayment Costs (See Instruction #5):

		Year 1	Year 5
19. Percent of plant capacity to serve permanent population:	_____ % ÷ 100 =	a. 0.	b. 0.
20. Percent of plant capacity to serve seasonal population:	_____ % ÷ 100 =	a. 0.	b. 0.
21. Debt repayment allocated for permanent capacity (Line 17a, b × 19a, b):		a. $ _____	b. $ _____
22. Debt repayment allocated for seasonal capacity (Line 18a, b × 20a, b):		a. $ _____	b. $ _____

B. Allocation of Annual O&M Costs (See Instruction #6)

23. Average Annual Permanent Residential Discharge:

a. Year 1: _____ (# Perm. H.H.) × _____ (# Persons/H.H.) × _____ (Gal/Person/day) × 365 days/year = _____ gallons per year

b. Year 5: _____ (# Perm. H.H.) × _____ (# Persons/H.H.) × _____ (Gal/Person/day) × 365 days/year = _____ gallons per year

24. Average Annual Seasonal Residential Discharge:

a. Year 1: _____ (# Seas. H.H.) × _____ (# Persons/H.H.) × _____ (Gal/Person/day) × _____ (# days/year) = _____ gallons per year

b. Year 5: _____ (# Seas. H.H.) × _____ (# Persons/H.H.) × _____ (Gal/Person/day) × _____ (# days/year) = _____ gallons per year

25. Residenti

(See Instr

a. Year 1:

b. Year 5:

26. Ratio of P

a. Year 1:

b. Year 5:

27. Ratio of

a. Year 1:

b. Year 5:

28. Annual C

a. Year 1:

b. Year 5:

29. Annual C

a. Year 1:

b. Year 5:

Step

30. Total An

a. Year 1

b. Year 5

31. Total An

a. Year 1

b. Year 5

Nex

*The basis for the cost calculations contained in this worksheet, including key assumptions, is explained in the instructions provided at the r

7a

First Year of **Full** Operation:	19____ (Year 1)	Fifth Year: 19____ (Year 5)
# of Permanent Residential Households:	_____	_____
# of Seasonal Residential Households:	_____	_____

25. Residential Flow Ratio = $\frac{\text{(Total System Flow − Non-residential Flow)}}{\text{Total System Flow}}$ (See Instruction #6)

a. Year 1: $\frac{(_____) - (_____)}{(_____)} = 0.$

b. Year 5: $\frac{(_____) - (_____)}{(_____)} = 0.$

26. Ratio of Permanent Residential to Total System Flow:

a. Year 1: $\frac{(\text{Line 23a})}{(\text{Line 23a} + \text{Line 24a})} \times \text{Line 25a} = 0.$

b. Year 5: $\frac{(\text{Line 23b})}{(\text{Line 23b} + \text{Line 24b})} \times \text{Line 25b} = 0.$

27. Ratio of Seasonal Residential to Total System Flow:

a. Year 1: $\frac{(\text{Line 24a})}{(\text{Line 23a} + \text{Line 24a})} \times \text{Line 25a} = 0.$

b. Year 5: $\frac{(\text{Line 24b})}{(\text{Line 23b} + \text{Line 24b})} \times \text{Line 25b} = 0.$

28. Annual O&M allocated to Permanent Households:

a. Year 1: Line 18a × Line 26a = $_____

b. Year 5: Line 18b × Line 26b = $_____

29. Annual O&M allocated to Seasonal Households:

a. Year 1: Line 18a × Line 27a = $_____

b. Year 5: Line 18b × Line 27b = $_____

Step 3: Calculation of Year 1, Year 5 Costs per Permanent, Seasonal Household

30. **Total Annual Cost per Permanent Household:**

a. Year 1: (Line 21a + Line 28a) ÷ # Perm. H.H. = $_____

b. Year 5: (Line 21b + Line 28b) ÷ # Perm. H.H. = $_____

31. **Total Annual Cost per Seasonal Household:**

a. Year 1: (Line 22a + Line 29a) ÷ # Seas. H.H. = $_____

b. Year 5: (Line 22b + Line 29b) ÷ # Seas. H.H. = $_____

Next Step: Perform Risk Analysis

(Follow Procedure on Reverse Side)

WORKSHEET

Agency _____

Date _____

Instructions

1. Worksheet #3 should be completed on a **system-wide** basis by the facility engineer and a financial officer. It is not necessary for each agency in a regional system to complete a separate Worksheet #3. **The techniques on this worksheet provide a simplified method for estimating household cost burden. If more accurate methods are available for specific calculations, enter the results in the appropriate blanks.** The results obtained are estimates of system **costs** per household and will **not** necessarily be the same as the **rates** which will be determined by community elected officials.
2. Worksheet #3 can be filled out more than once varying key assumptions to show the sensitivity of cost estimates by household to risk factors such as inflation, local capital costs, growth in households, or PIF revenue. Refer to back of Worksheet #3 for detailed instructions on conducting risk analysis.
3. All costs should be expressed at **1982 prices** (or other year if used consistently); for existing system costs in Line 14, use latest budget data to project O&M costs which are to be carried over to Years 1 and 5, then adjust to 1982 price levels.
4. "Available Local Funds" (Line 2) is the amount of money (cash reserves, accumulated funds, or other) projected to be available for financing proposed improvements. Estimates for Line 2 and 5 should be based on the agency's experience with similar financing issues; rough estimates can be based on the percentages shown.
5. Debt repayment for facility capital is allocated according to the plant treatment capacity needed for the permanent and seasonal population and other uses, since capacity must be sufficient to serve all users at peak usage. Lines 19 and 20 do not necessarily add up to 100%; a percentage of the remaining capacity can be calculated for specific commercial or other users and applied to the total debt repayment costs (Line 17) to obtain their share of the capital debt costs.
6. Annual O&M costs are allocated on the basis of treatment of annual wastewater flows attributable to permanent and seasonal populations. In Lines 23 and 24, the annual household discharge (excluding infiltration/inflow) from permanent and seasonal residences is calculated to give a ratio of permanent to seasonal use. Lines a, b is a calculation of the decimal ratio of residential flow (all flow not attributable to other uses; should include infiltration/inflow) to total system flow for Year 1 and 5. In Lines 26 and 27, the permanent and seasonal use ratios are applied to the total residential flow ratios to obtain the ratios of permanent and seasonal flow (including infiltration/inflow) to total system flow. These ratios are multiplied in Lines 28 and 29 by total annual O&M costs to calculate the permanent and seasonal cost shares. O&M costs for a commercial or other user can be derived separately for Year 1 and 5 as follows: **(1) Divide:** Total annual O&M costs (Line 18 a,b) ÷ Total annual system flow (for Year 1,5) = Annual O&M cost per gallon. **(2) Multiply:** Annual O&M cost per gallon × # gallons per year estimated for the specific user. This calculation assumes that each gallon of system flow has similar strength characteristics.

ned in the instructions provided at the right.

Year of **Full** Operation: 19____ (Year 1) Fifth Year: 19____ (Year 5)

Permanent Residential Households: _____ _____

Seasonal Residential Households: _____ _____

idential Flow Ratio = (Total System Flow − Non-residential Flow) / Total System Flow

Instruction #6)

ar 1: (_____) − (_____) / (_____) = 0.

ar 5: (_____) − (_____) / (_____) = 0.

o of Permanent Residential to Total System Flow:

ar 1: (Line 23a) / (Line 23a + Line 24a) × Line 25a = 0.

ar 5: (Line 23b) / (Line 23b + Line 24b) × Line 25b = 0.

o of Seasonal Residential to Total System Flow:

ar 1: (Line 24a) / (Line 23a + Line 24a) × Line 25a = 0.

Year 5: (Line 24b) / (Line 23b + Line 24b) × Line 25b = 0.

ual O&M allocated to Permanent Households:

Year 1: Line 18a × Line 26a = $_____

Year 5: Line 18b × Line 26b = $_____

nual O&M allocated to Seasonal Households:

Year 1: Line 18a × Line 27a = $_____

Year 5: Line 18b × Line 27b = $_____

p 3: Calculation of Year 1, Year 5 Costs per Permanent, Seasonal Household

tal Annual Cost per Permanent Household:

Year 1: (Line 21a + Line 28a) ÷ # Perm. H.H. = $_____

Year 5: (Line 21b + Line 28b) ÷ # Perm. H.H. = $_____

tal Annual Cost per Seasonal Household:

Year 1: (Line 22a + Line 29a) ÷ # Seas. H.H. = $_____

Year 5: (Line 22b + Line 29b) ÷ # Seas. H.H. = $_____

xt Step: Perform Risk Analysis

(Follow Procedure on Reverse Side)

t the right.

WORKSHEET #3

Agency _____

Date _____

Instructions

1. Worksheet #3 should be completed on a **system-wide** basis by the facility engineer and a finance officer. It is not necessary for each agency in a regional system to complete a separate Worksheet #3. **The techniques on this worksheet provide a simplified method for estimating household cost burden. If more accurate methods are available for specific calculations, enter the results in the appropriate blanks.** The results obtained are estimates of system **costs** per household and will **not** necessarily be the same as the **rates** which will be determined by community elected officials.
2. Worksheet #3 can be filled out more than once, varying key assumptions to show the sensitivity of cost estimates by household to risk factors such as inflation, local capital costs, growth in households, or PIF revenue. Refer to back of Worksheet #3 for detailed instructions on conducting risk analysis.
3. All costs should be expressed at **1982 price levels** (or other year if used consistently); for existing system costs in Line 14, use latest budget year data to project O&M costs which are to be carried over to Years 1 and 5, then adjust to 1982 price levels.
4. "Available Local Funds" (Line 2) is the amount of money (cash reserves, accumulated funds, or other) projected to be available for financing the proposed improvements. Estimates for Lines 4 and 5 should be based on the agency's experience with similar financing issues; rough estimates can be based on the percentages shown.
5. Debt repayment for facility capital is allocated according to the plant treatment capacity needed for the permanent and seasonal populations and other uses, since capacity must be sufficient to serve all users at peak usage. Lines 19 and 20 will not necessarily add up to 100%; a percentage of the remaining capacity can be calculated for specific commercial or other users and applied to the total debt repayment costs (Line 17) to derive their share of the capital debt costs.
6. Annual O&M costs are allocated on the basis of treatment of annual wastewater flows attributable to permanent and seasonal populations. In Lines 23 and 24, the annual household discharge (excluding infiltration/inflow) from permanent and seasonal residences is calculated to give a ratio of permanent to seasonal use. Line 25 a, b is a calculation of the decimal ratio of total residential flow (all flow not attributable to other uses; should include infiltration/inflow) to total system flow for Year 1 and 5. In Lines 26 and 27, the permanent and seasonal use ratios are applied to the total residential flow ratios to derive the ratios of permanent and seasonal flows (including infiltration/inflow) to total system flow. These ratios are multiplied in Lines 28 and 29 by total annual O&M costs to calculate the permanent and seasonal cost shares. O&M costs per commercial or other user can be derived separately for Year 1 and 5 as follows: **(1) Divide:** Total annual O&M costs (Line 18 a,b) ÷ Total annual system flow (for Year 1,5) = Annual O&M cost per gallon. **(2) Multiply:** Annual O&M cost per gallon × # gallons per year estimated for the specified user. This calculation assumes that each gallon of system flow has similar strength characteristics.

Prepared for EPA Region IV for N.C. Barrier Islands EIS by BMML Briscoe, Maphis, Murray & Lamont, Inc. 2855 Valmont Road, Boulder, Colorado 80301 (12/81)

Factors for Annual Debt Repayment
(Capital Recovery Factors)

Multiply the Total Capital Debt shown in Line 6 by the appropriate factor for the assumed rate of interest and term of maturity to derive a fixed amount for annual debt repayment. Enter on Line 7.

Term of Maturity	Interest Rate				
	8%	10%	12%	15%	20%
10 years	0.14903	0.16275	0.17698	0.19925	0.23852
15 years	0.11683	0.13147	0.14682	0.17102	0.21388
20 years	0.10185	0.11746	0.13388	0.15976	0.20536
25 years	0.09368	0.11017	0.12750	0.15470	0.20212

RISK ANALYSIS OF HOUSEHOLD COST ESTIMATES

Cost estimates on Worksheet #2 and the calculations made on Worksheet #3 are based initially on assumptions considered "most likely" at the time they are made but may vary as grant awards, design and construction proceed. It is important to test the sensitivity of Costs per Household to variables such as inflation, growth in households, local funding share, amount of plant investment fees, proportion of permanent/seasonal population, and any other factors which are likely to vary from what is being planned.

Sensitivity or Risk Analyses can be conducted by changing only a few of the procedures on Worksheet #3, each time varying one assumption to test the effect on the cost per household. For each Risk Analysis performed, a separate Worksheet #3 should be used, with the new assumption clearly indicated.

Step 1: Risk Factor: Inflation

1. Assume an annual rate of inflation which might be expected to affect the annual O&M costs: debt repayment will not be affected by inflation since it is a fixed cost determined at the time of financing.
2. Calculate the number of years' inflation affecting costs in Years 1 and 5: subtract 1982 (or the year initially used for expressing all costs) from Year 1 and 5.
3. In the Inflation Factor table, find the factors for the assumed rate of inflation and the appropriate number of years (two different factors for Year 1 and 5).
4. Multiply the factors by O&M costs given for the Existing System (Lines 14 a, b) and Proposed Improvements (Lines 16 a, b).

Example: **Assumed rate of inflation:** 10% **Year 1:** 1984 **Year 5:** 1988
O&M costs (1982 prices): $17,500

Factor for 2 years' inflation (Year 1): 1.210 × $17,500 = $21,175

Factor for 6 years' inflation (Year 5): 1.772 × $17,500 = $31,010

5. Re-calculate Lines 28-31 on Worksheet #3 using adjusted O&M costs.
6. Perform a second Risk Analysis using a higher assumed rate of inflation to measure the increased risk.

Note: Inflation factors must not be used in overall alternative analysis, except as allowed by regulation (e.g. land, energy costs). These factors are to be used for estimating **local** costs as they may be affected in future years.

Inflation Factor Table

Annual Rate of Inflation:	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%
1 year	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14	1.15	1.16
2 years	1.145	1.166	1.188	1.210	1.232	1.254	1.277	1.300	1.323	1.346
3 years	1.225	1.260	1.295	1.331	1.368	1.405	1.443	1.482	1.521	1.561
4 years	1.311	1.360	1.412	1.464	1.518	1.574	1.630	1.689	1.749	1.811
5 years	1.403	1.469	1.539	1.611	1.685	1.762	1.842	1.925	2.011	2.100
6 years	1.501	1.587	1.677	1.772	1.870	1.974	2.082	2.195	2.313	2.436
7 years	1.606	1.714	1.828	1.949	2.076	2.211	2.353	2.502	2.660	2.826

Step 2: Risk Factor: Growth in Households

The first estimates of the number of permanent and seasonal households in Years 1 and 5, given at the top of Worksheet #3, are derived from the **anticipated growth rate** used in designing the facilities. If growth is slower than anticipated, there may be fewer households to share the annual costs and less PIF revenues to offset debt repayment costs. If the proportion of permanent to seasonal households varies, this may also affect costs per household.

1. Conduct a Risk Analysis by changing the number of households in Year 1 and 5 to reflect a slower rate of growth. Re-calculate Lines 23, 24, 30, and 31.
2. Vary the proportion of permanent and seasonal households expected. Re-calculate Lines 23, 24, 30 and 31.

Step 3: Risk Factor: Amount of Local Funding Share

Worksheet #2 provides estimates of Total Capital Costs, outside funding, and local share based on current expectations about funding. The actual amount to be funded by the local agency is likely to change as planning proceeds and grant awards are determined. The effects of less optimistic view of funding should be tested.

1. Conduct a Risk Analysis by assuming higher initial capital costs, or assume reduced or no outside funding on Worksheet #2. Enter new local capital cost on Line 1; re-calculate Lines 3-7, 12, 17, 21, 22, 30, and 31.
2. Complete Worksheet #3 with the higher assumed capital cost.

Step 4: Risk Factor: Plant Investment Fees

The amount of PIF funds available depends on the PIF charge set by the operating agency and on the amount of growth in new connections on which PIF's are charged. The amount of PIF revenue can be varied by assuming different PIF charges or total PIF funds available in Year 1 and 5 to check the effect on annual costs per household.

1. Vary the planned PIF charge in Line 9 and the total PIF revenue in Line 11 to calculate a different amount of net annual debt repayment to be shared by all system users.
2. Re-calculate Lines 12, 15, 17, 21, 22, 30 and 31.

WORKSHEET #4: AGENCY ROLES AND COST RESPONSIBILITIES

Several decisions about system management which will have financial implications must be made before adoption of a wastewater treatment plan. There may be several agencies which have institutional powers that affect the system, and it is important to establish who will be responsible for various system functions in the general areas of planning, operations, management, and regulation.

Worksheet #4, **Agency Roles and Cost Responsibilities**, gives an indication of the types of functions and activities for which various agencies may be assigned primary responsibility. Even in the case of a single agency such as a city or town providing treatment for its constituents, there may nevertheless be other agencies whose actions can assure support for the system (for example, a county's powers to make land-use decisions). If a regional system is planned, two or more agencies will probably be contributing financially as well as sharing other management responsibilities. If cost-sharing is involved, a suitable method of allocating the costs must be agreed upon; each agency's financial and management responsibilities should be identified in the manner suggested on Worksheet #4. A clear understanding of how these roles will be determined is critical to successful implementation through a cooperative agreement.

AGENCY ROLES & COST RESPONSIBILITIES*

A. Assignment of System Functions

On the top row of the chart, enter the names of all agencies or groups which will have primary responsibilities in the system; then indicate which functions each will perform:

Agency Names and Types (City, County, District, Industry, etc.)					
System Functions					
1. **System Planning:**					
2. **Ownership of:**					
a. Treatment Facilities					
• Centralized					
• Community					
• On-Site					
b. Collection Lines					
c. Disposal Facilities					
d. Other _____					
3. **Financial Responsibilities:**					
a. Capital Financing					
b. Annual O&M Costs					
c. Grant Administration					
d. Accounting System					
4. **Management:**					
a. System Operation					
b. Policy Decisions					
5. **Regulation:**					
a. Ordinances					
b. Enforcement of Standards					

B. Allocation of Total System Costs (See Instruction #3)

6. Enter total local capital costs (Worksheet #2, Line 25a): $ _____

7. Which agencies will contribute to capital financing costs:

_____

8. Explain basis or give formula or example indicating how local capital costs will be allocated among above agencies:

9. How much of t

Agenc

a. _____

b. _____

c. _____

10. Enter total ann

11. Which agencie

_____

12. Explain basis

C. Legal

Indicate which of t system service are

13. Requirement th as well as new

14. Extension polic facilities to ser

15. Minimum desig

16. Requirement fo

17. Prohibition of li

18. Prohibition of li

19. Other: _____

D. Imple

20. An intergovernm

_____

_____

Indicate the pro

21. Establishment

22. Delineation of,

23. Methods and ac

24. Intended metho

25. Guarantee of tr

26. Assignment of

27. Other: _____

***Refer to Instructions at the right before completing the worksheet.**

Agency _____

Date _____

9. How much of the total local capital costs will each agency be responsible for?

Agency	Amount	Agency	Amount
a. _____	$ _____	d. _____	$ _____
b. _____	$ _____	e. _____	$ _____
c. _____	$ _____		

10. Enter total annual O&M cost (Worksheet #2, Line 25b): $ _____

11. Which agencies will contribute to annual O&M costs (Line 3b, above):

_____

12. Explain basis or give formula or example for allocation of O&M costs among above agencies:

C. Legal Support for System Implementation

Indicate which of the following measures will be established as ordinances or resolutions governing the system service area:

	Yes	No
13. Requirement that all **potential users** in the service area (including those now on septics as well as new development) hook into system:	☐	☐
14. Extension policies establishing responsibility for costs, design, etc. of extension of facilities to serve new developments:	☐	☐
15. Minimum design standards to assure compatible facilities:	☐	☐
16. Requirement for public ownership of collection lines:	☐	☐
17. Prohibition of illegal or excessive discharges to system:	☐	☐
18. Prohibition of illegal connections to system:	☐	☐
19. Other: _____	☐	☐

D. Implementation Agreements

20. An intergovernmental agreement will be established among the following agencies: _____

_____

_____

Indicate the provisions which will be included in the agreement:	Yes	No
21. Establishment and membership of system management oversight committee:	☐	☐
22. Delineation of, and provision for amending, service area boundaries:	☐	☐
23. Methods and administration of cost allocations for capital and O&M:	☐	☐
24. Intended methods of financing and provision for establishing rates:	☐	☐
25. Guarantee of treatment capacity for participating agencies:	☐	☐
26. Assignment of responsibilities for all system functions listed in Lines 1 through 5 above:	☐	☐
27. Other: _____	☐	☐

Instructio

1. Worksheet #4 shou completed as a joi effort by represent of all involved loca cies (the members financial managem oversight committe
2. This worksheet is p ily intended for use situation where a re system, serving tw more agencies, is b planned. Much of t formation requeste nevertheless apply systems involving c one agency.
3. Section B applies c a regional situation two or more agenci share cost-bearing responsibilities. W there may be only c lead agency respo for financing total l costs (Line 3a), the participating agenc will be allocated co shares which are th reimbursed on som agreed-upon basis, described in Lines 12. Cost allocation among participatin agencies should no confused with the a tion of annual costs various classes of c (presented on Work #3). The latter is an estimation of avera dividual **user** costs system-wide basis Worksheet #4, Sect asks how the total system costs will b divided up among c **cies**.
4. The information en on this worksheet i planning purposes does not constitute mal agreement amo agencies. Mutual co ation should be gua teed by an intergov mental agreement (Section D).

WORKSHEET #4

Agency _____

Date _____

he total local capital costs will each agency be responsible for?

y	Amount	Agency	Amount
_____	$_____	d. _____	$_____
_____	$_____	e. _____	$_____
_____	$_____		

al O&M cost (Worksheet #2, Line 25b): $ _____

will contribute to annual O&M costs (Line 3b, above):

_____

r give formula or example for allocation of O&M costs among above agencies:

pport for System Implementation

he following measures will be established as ordinances or resolutions governing the a:

	Yes	No
t all **potential users** in the service area (including those now on septics development) hook into system:	☐	☐
es establishing responsibility for costs, design, etc. of extension of new developments:	☐	☐
standards to assure compatible facilities:	☐	☐
public ownership of collection lines:	☐	☐
egal or excessive discharges to system:	☐	☐
gal connections to system:	☐	☐
_____	☐	☐

ntation Agreements

ental agreement will be established among the following agencies: _____

_____

_____

visions which will be included in the agreement:	Yes	No
nd membership of system management oversight committee:	☐	☐
nd provision for amending, service area boundaries:	☐	☐
ministration of cost allocations for capital and O&M:	☐	☐
s of financing and provision for establishing rates:	☐	☐
atment capacity for participating agencies:	☐	☐
esponsibilities for all system functions listed in Lines 1 through 5 above:	☐	☐
_____	☐	☐

Instructions

1. Worksheet #4 should be completed as a joint effort by representatives of all involved local agencies (the membership of financial management oversight committee).
2. This worksheet is primarily intended for use in a situation where a regional system, serving two or more agencies, is being planned. Much of the information requested may nevertheless apply to systems involving only one agency.
3. Section B applies only to a regional situation where two or more agencies will share cost-bearing responsibilities. While there may be only one lead agency responsible for financing total local costs (Line 3a), the other participating agencies will be allocated cost-shares which are then reimbursed on some agreed-upon basis, to be described in Lines 8 and 12. Cost allocation among participating agencies should not be confused with the allocation of annual costs to various classes of users (presented on Worksheet #3). The latter is an estimation of average individual **user** costs on a system-wide basis while Worksheet #4, Section B asks how the total system costs will be divided up among **agencies**.
4. The information entered on this worksheet is for planning purposes and does not constitute a formal agreement among agencies. Mutual cooperation should be guaranteed by an intergovernmental agreement (Section D).

WORKSHEET #5: AGENCY FINANCIAL CAPABILITIES

On Worksheet #2, total local system costs are identified; Worksheet #3 gives an estimate of the cost burden for individual households on a system-wide basis. On Worksheet #4, financial and institutional responsibilities for the individual participating agencies are determined. An assessment of whether each agency can afford its financial commitment to the proposed system, in light of its existing governmental financial activities, is the next step in financial planning. If a regional system is being planned, each agency must address this question by filling out Worksheet #5.

Agency Financial Capabilities (Worksheet #5) is a compilation of financial data which provides a basis for judgments concerning whether and how the agency can finance its share of system costs. Information concerning basic resources, governmental fund activities, existing debts, and tax rates is used to indicate the current financial status of the agency. In addition, the agency's intended methods of financing its share of capital and O & M costs are to be recorded on the worksheet.

The data provided do not answer the question of whether the agency has the necessary financial capability. Interpretation of the information is left to the agency's financial experts; however, some guidelines are provided on the back of Worksheet #5 for analysis of the information.

AGENCY FINANCIAL CAPABILITIES

A. Basic Resources

	(Fiscal Year 1981)	(Fiscal Year 1976)	(Percent Change) (1976 to 1981)
1. Population Within Jurisdiction			%
2. Taxable Assessed Valuation	$	$	%
3. Assessed Valuation Per Capita (Line 2 ÷ Line 1)	$ per person	$ per person	%

B. Financial Position of General, Sewer and/or Water Funds
(See Instruction #4)

General Fund

	(F.Y. 1981)		(F.Y. 1976)		(% Change) (1976 to 1981)
4. Working Capital (Current Assets – Current Liabilities)					%
5. Beginning Fund Balance					%
	(Amount/Percent of Total)				
6. **Total Revenues:**	$	100%	$	100%	%
a. Property Tax		%		%	
b. Other Taxes		%		%	
c. Fees & Charges		%		%	
d. Other Local		%		%	
e. Non-Local		%		%	
f. Transfers In: Total		%		%	
From:					
7. **Total Expenditures:**	$	100%	$	100%	%
a. General/Administrative		%		%	
b. Operations/ Maintenance		%		%	
c. Capital Outlay		%		%	
d. Debt Service		%		%	
e. Other		%		%	
f. Transfers Out: Total		%		%	
To:					
8. Ending Fund Balance:	$		$		%

Sewer Fund (Or Water/Sewer Fund, or Water Fund)

	(F.Y. 1981)	(F.Y.
9. Working Capital (Current Assets – Current Liabilities)	$	$
10. Beginning Fund Balance	$	$
	(Amount/Percent of To	
11. **Total Revenues:**	$ 100%	$
a. Charges for Services	%	
b. Connection Fees	%	
c. Property Tax	%	
d. Other	%	
e. Transfers In: Total	%	
From:		
12. **Total Expenditures:**	$ 100%	$
a. General/Administrative	%	
b. Operations/ Maintenance	%	
c. Capital Outlay	%	
d. Debt Service	%	
e. Other	%	
f. Transfers Out: Total	%	
To:		
13. Ending Fund Balance	$	$

C. Property Tax Rates & Collections

	(F.Y. 1981)	(F.Y. 1976)
14. **Total Rate** per $100 (All Funds)	¢	¢
a. General Purpose	¢	¢
b. Debt Retirement	¢	¢
c. Other	¢	¢

	(F.Y. 1981)	(F.Y.
15. Total Property Tax Collections	$	$
16. Total Collections Per Capita	$	$

17. Is the percent change shown in Line 16 less than, equal to, or greater than the rate of inflation in local costs of your agency over the period from 1976 to 1981?

D. Existing Debt

18. **Existing Long-Term Debt**
a. General Obligation Bo
b. Revenue Bonds:
c. Bonds authorized but unissued:
d. Other long-term debt:

***Refer to Instructions at the right before completing the worksheet.**

ITIES*

WORKSHEET #5

Agency _____

Date _____

ting Debt and Debt Capacity (See Instruction #5)

Long-Term Debt:	Purpose	Amount Outstanding	Annual Debt Payment	Source of Repayment
l Obligation Bonds:		$	$	
		$	$	
		$	$	
e Bonds:		$	$	
		$	$	
authorized				
ssued:		$	$	
ng-term debt:		$	$	

Water Fund)

1)	(F.Y. 1976)	(% Change) (1976 to 1981)
	$	%
	$	%

unt/Percent of Total)

100%	$	100%	%
%		%	
%		%	
%		%	
%		%	
%		%	
100%	$	100%	%
%		%	
%		%	
%		%	
%		%	
%		%	
%		%	
	$		%

1)	(F.Y. 1976)	(% Change) (1976 to 1981)
	$	%
	$	%

cy

19. **Net** Outstanding Debt: $ _____
(N.C. Statutes 159-55)

20. Net Debt as % of Assessed Value: _____ %

21. Remaining Capacity for G.O. Debt:

$$\frac{(8\% - \underset{\text{Line 20}}{____})}{100} \times \underset{\text{Current Assessed Value}}{____} = \$____$$

E. Intended Methods of Financing Capital and O&M Costs (See Instruction #6)

22. Individual agency's share of local capital financing: $ _____
(See Worksheet #2, 4)

23. Intended methods for capital financing:

	Method (G.O., Revenue, Loan, etc.)	Amount	Source of Repayment (Taxes, PIF's, Assessments)	% Each Source
a.	_____	$_____	_____	_____%
b.	_____	$_____	_____	_____%
c.	_____	$_____	_____	_____%

24. Total Net Debt margin anticipated after financing: _____% of Assessed Valuation

25. Increase in tax rate (if any) due to proposed financing: _____¢ per $100

26. Individual agency's share of annual O&M costs (See Worksheet #2, 4): $_____

27. Intended sources of annual operating revenue (give % of total amount required):

a. User charges : _____%
b. Property tax : _____%
c. Other _____ : _____%
Total: 100%

Instruction

1. Worksheet #5 should be completed separately for **each** agency which will have financial responsibility in the proposed system by a finance officer of that agency.
2. Sources of financial information are the financial audit reports prepared for Fiscal Years 1981 (July 1, 1980 to June 30, 1981) and 1976. If more recent data are available (for example, after the end of fiscal year 1982), use the most recent audited year and five years previous, indicating which years are represented.
3. Percent Change 1976 to 1981 is the total amount of change occurring in that period. If the percentage represents a decrease, indicate by enclosing the figure in parentheses.
4. Financial information is required for two types of funds. General Fund Information is to be filled out for all general-purpose governments (not applicable for special-purpose districts). For all agencies currently operating a wastewater and water system, information on the Sewer Fund is preferred. If both activities are operated as a combined Water/Sewer Fund, use these data. If the agency operates only a water system, enter these data. Indicate which fund is represented, if either.
5. Information about the current status of the agency's long-term debt and debt repayment requirements is available from the N.C. Local Government Commission. Net Outstanding Debt is defined in the N.C. General Statutes, Section 159-55, and is the basis for calculating an agency's debt subject to the 8% statutory limitation.
6. Intended methods of financing represent the best judgment of the agency's finance officer, based on current financial condition regarding potential sources of financing for its capital and operating revenue and the resultant effect on tax rates, debt margin, etc.
7. Interpretation of the information provided on this worksheet is the responsibility of local officials. Refer to back of this worksheet for some guidelines to the interpretation.

INTERPRETATION OF AGENCY FINANCIAL CAPABILITIES

The financial data given on Worksheet #5 are the basis for assessing an agency's ability to assume the financial commitment necessary for wastewater system financing. The interpretation of the data is left to the agency's finance officers who may make recommendations about financing and the elected officials who must make the final decision regarding financial commitment to the system. Nevertheless, some guidelines to help interpret the meaning of the information on the other side are provided here.

A. Basic Resources

If assessed valuation is increasing more rapidly than population (a net gain in per capita valuation), the tax base is probably expanding to reflect some degree of inflation in addition to population growth. Growth in per capita valuation will relieve the burden on the taxpayer; on the other hand, decreasing valuation per capita implies the reverse.

B. Financial Position of General, Sewer, and/or Water Funds

Data on the General Fund are used to indicate whether an agency is currently straining to pay for basic services provided and in general summarizes its state of financial health. For both the General and the Sewer or Water Funds, Working Capital (Lines 4, 9) shows general liquidity or the agency's ability to cope with day-to-day financial obligations.

The Beginning and Ending Fund Balances indicate the extent to which the agency is accumulating or depleting surpluses, which may or may not represent funds available to help finance wastewater improvements. A comparison of Total Revenues with Total Expenditures shows whether current revenues are adequate to pay for current costs or if carried-over balances are relied on to make up the deficit. Percentages of various categories of revenues show which sources are relied upon most heavily for fund support.

The percentage of change over the 1976 to 1982 period indicates the relative growth in revenues as compared with expenditures and also allows comparison of both with inflation to show if revenues are responding sufficiently to offset rising costs. If revenues and costs are not keeping pace with inflation per capita (i.e. with population growth), future financial difficulties may arise.

C. Property Tax Rates and Collections

Property taxes are probably the mainstay of local government income. The question is, are property tax rates being pushed to the limit? Compare the general purpose rate to the limitation imposed by North Carolina law of $1.50 per $100 for Group II (general) functions. Although the rate for debt service is not subject to a limit, this rate and the total tax rate suggest the extent of the current burden on the taxpayers. Note that the rates given on this worksheet represent only the levies of the agency named. Other jurisdictions are taxing the same taxpayers, creating an overlapping tax burden which should also be considered.

Although total collections per capita may have increased over the five year period, it is important to compare this with the increase in inflation for the same period to see if the per capita tax dollar is keeping pace with inflation.

D. Existing Debt and Debt Capacity

The amounts and types of outstanding debt carried by the agency may indicate whether it has any margin to incur additional debts for capital financing. Net general outstanding debt is subject to a statutory limit of 8% of current assessed valuation in North Carolina. Calculation of remaining capacity shows at a glance whether the agency can use G.O. financing. In certain cases, exemption from the limitation may be granted for sewer system financing; otherwise other methods may have to be considered. From the point of view of the taxpayers and lenders as well, bonds repaid from sewer charges might be considered less burdensome than those repaid from property taxes.

E. Intended Methods of Financing

After completion of the rest of Worksheet #5, this section requests information regarding which methods of capital financing seem most likely or appropriate for each agency with financing responsibilities, and what effects they might have on statutory limitations. Sources of income for O&M are usually based on a user charge system, although some other sources may contribute revenues for system operations. This provides a preliminary indication of the types of rate structures that might be established and how these decisions might relate to existing levels of property taxes and other revenues relied on as income to the General Fund.

WORKSHEET #6: SUMMARY OF FINANCIAL AND INSTITUTIONAL INFORMATION

The final worksheet in the series serves the purpose of summarizing the information provided on the preceding worksheets. Information on the proposed system, its total estimated costs, household cost burden, agency responsibilities, and intended financing methods is presented in a concise format. The primary purpose for this worksheet is to summarize the results of the analytical and planning tasks performed in the financial planning process. Worksheet #6 should be completed, reproduced and distributed at a public hearing for consideration of the recommended system alternative(s). If more than one plan is being presented, several Worksheets #6 could be filled out, one for each plan, to allow comparison of the financial and institutional implications of each.

The **Financial Planning Handbook** and Worksheets #1-6 should be considered tools to promote better understanding of the implications of facility planning. They can serve the purpose of anticipating outcomes of various decisions which might be made during the planning process. They should not be considered an end product but can best be used as planning aids. As such, the whole package, or any part of it, can be used repeatedly at various stages of facility planning. Even as design and construction progress the package can be used to refine the financial and institutional information provided.

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SUMMARY OF FINANCIAL AND INSTITUTIONAL INFORMATIO

A. What is Proposed in the Facility Plan?

1. What type of system is planned?
   - ☐ Centralized wastewater treatment
   - ☐ Community treatment facilities
   - ☐ On-site systems
   - ☐ Other: _____

2. The proposed facilities include:
   - ☐ New facilities
   - ☐ Expansion of existing facilities
   - ☐ Upgrading or replacement of existing facilities

3. Facilities to be constructed:
   - ☐ Treatment facility(ies)
   - ☐ On-site systems (individual)
   - ☐ Interceptor sewers
   - ☐ Pump station(s)
   - ☐ Collection lines
   - ☐ Other components: _____

4. The facilities will benefit:
   - ☐ Population now on sewers
   - ☐ Anticipated growth
   - ☐ Developed areas served by septics

5. Areas to be served (attach map):
   - ☐ Municipality
   - ☐ County
   - ☐ District
   - ☐ Industry
   - ☐ Other: _____

6. Estimated population:

	Permanent	Seasonal
in first full year of operation:	_____	_____
in fifth year of operation:	_____	_____

7. Give a timetable for construction and operation of the proposed facilities (attach schedule):
   - Begin construction _____
   - Completion of system _____
   - First year of service _____
   - First year of full operation _____

B. How Much Will the System Cost At Today's (1982) Prices?

(See Worksheet #2)

8. Estimated Capital Costs of Proposed Improvements: (Worksheet #2, Line 25a)

(Total Capital Cost)	–	(Expected EPA Amount)	–	(Other Non-Local Amount)	–	(Local Funds Available)	=	Amount to be Locally Financed
$_____	–	$_____	–	$_____	–	$_____	=	$_____

9. Estimated annual operations, maintenance and replacement costs:
   - Existing facilities: $_____ per year (Worksheet #3, Line 14)
   - New facilities:
     - Year 1: $_____ per year
     - Year 5: $_____ per year (Worksheet #3, Line 16)

10. Method of calculating costs:
    - ☐ Standard engineering cost curves
    - ☐ Comparison to comparable system
    - ☐ Adjustment for local conditions
    - ☐ Other (describe) _____

C. What Are the Average Annual Costs to Typical Permanent and Seasonal Households? (See Worksheet #3)

11. How many permanent households are expected to be served in Year 1?_____ in Year 5?_____

12. What is the average annual cost for a **permanent** household in Year 1? $_____ in Year 5? $_____ (Worksheet #3, Line 30)

13. How many seasonal or part-time households are expected to be served in Year 1?_____ in Year 5?_____

14. What is the average annual cost for a **seasonal** household in Year 1? $_____ in Year 5? $_____ (Worksheet #3, Line 31)

***Refer to instructions at the right for the basis of the information on this worksheet.**

D. What Role Governme

15. What agencies will:
    - Own the wastewater f
    - Operate the facilities?
    - Finance the construct

16. Will system costs be sh agencies? Yes ☐
    Names: _____

17. About what % of total each agency bear? (Wo
    Name: _____

E. How Will t

20. Intended methods of fi

Method
G.O. Bond
Revenue Bond
Loan
Financing Agreement
Other

21. Intended sources of an

Methods	Percen
User charges	
PIF revenue	
Property tax	
Other	

22. A system of user charg
    - ☐ Surcharge for exces
    - ☐ Variable rates for st
    - ☐ Rates established fo

23. What effect will financi agency's other financi
    - ☐ Will create severe li
    - ☐ Will require modera
    - ☐ Will not constrain o

MATION*

First **Full** Year of System Operation: 19____
Description of Proposed Improvements:

WORKSHEET #6

Agency _____
Date _____

D. What Roles and Responsibilities Will Local Government Have? (See Worksheet #4)

15. What agencies will:
- Own the wastewater facilities? _____
- Operate the facilities? _____
- Finance the construction costs? _____

16. Will system costs be shared among two or more agencies? Yes ☐ No ☐
Names: _____ _____ _____ _____

17. About what % of total local capital costs will each agency bear? (Worksheet #4, Line 8)
Name: _____ %
_____ %
_____ %
_____ %

18. A sewer use ordinance will be adopted that: (Worksheet #4, Part C)

Yes	No	
☐	☐	Requires developed areas to hook in
☐	☐	Establishes system extension policies
☐	☐	Sets minimum design standards
☐	☐	Requires public ownership of collection lines
☐	☐	Prohibits discharge of toxic substances
☐	☐	Prohibits illegal connections to system

19. Will an intergovernmental agreement be established to assure cooperative mutual support among involved agencies for financial and institutional implementation? (Worksheet #4, Part D)
Yes ☐ No ☐

E. How Will the Facilities be Financed? (See Worksheet #5)

20. Intended methods of financing capital costs: (Worksheet #5, Line 23).

Method	Financing Agency	Amount to be Financed	Interest Rate	Term of Maturity	Annual Debt Repayment
G.O. Bond	_____	$_____	____%	____ years	$_____ per year
Revenue Bond	_____	$_____	____%	____ years	$_____ per year
Loan	_____	$_____	____%	____ years	$_____ per year
Financing Agreement	_____	$_____	____%	____ years	$_____ per year
Other	_____	$_____	____%	____ years	$_____ per year

21. Intended sources of annual operating income:

Methods	Percentage of Total Revenue
User charges	_____ %
PIF revenue	_____ %
Property tax	_____ %
Other	_____ %

22. A system of user charges will be established that includes:
- ☐ Surcharge for excessive flow
- ☐ Variable rates for strength of flow
- ☐ Rates established for various classes of users

23. What effect will financing the agency's share of local costs for the proposed system have on the agency's other financial commitments?
- ☐ Will create severe limitations
- ☐ Will require moderate commitment
- ☐ Will not constrain other activities at all

Instructions

1. Worksheet #6 is the last of a series of financial and institutional planning aids which have been filled out by agencies involved in a wastewater facility planning process. It summarizes the results of the financial and institutional analyses conducted by the agency named above during preliminary planning.
2. Worksheet #6 is to be filled out after completion of Worksheets #1 through 5. The results and responses obtained on those worksheets are to be entered in the appropriate spaces on Worksheet #6 as indicated.
3. Worksheet #6 may be used as an information sheet to be handed out to those attending the public hearing for presentation of the facility alternatives. Note that the information contained on this worksheet represents assumptions about financial and institutional information which may be accurate today but are subject to change as planning, design, and construction progress.

Prepared for EPA Region IV for N.C. Barrier Islands EIS by BMML Briscoe, Maphis, Murray & Lamont, Inc. 2855 Valmont Road, Boulder, Colorado 80301 (12/81)